Receivers and Transmitters

USSR UDC: 621.372.413(088.8)

ORLOV, S. I.

"A Coaxial Tank Circuit"

USSR Author's Certificate No 262199, filed 23 Sep 68, published 11 Jun 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1B167 P)

Translation: The proposed tank circuit is equipped with a variable capacitor connected to the inner conductor of the tank. To prevent resonance on the fundamental frequency when the tank circuit is excited on a harmonic, the capacitor is connected at a voltage node in a break in the inner conductor of the circuit, the movable section of the tank being connected through a capacitive contact to the end wall of the tank. Two illustrations.

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UDC 548.1

USSR

VAYNSHTEYN, B. K., ORLOV, S. S.

"Theory of Reproduction of Functions by their Projections"

Moscow, Kristallografiya, Vol 17, No 2, 1972, pp 253-257

Abstract: A study was made of the reproduction of two-dimensional functions $\rho(r)$ by synthesis of the projecting functions $\Sigma(r)$ and directly by the projections L of the function ρ. The transition to the Radon formulas and averaging the projections are discussed. Fourier transforms are used in deriving the formulas and representing the functions. Diagrams are presented for the reciprocal space Z(S) and its cross section $\Phi_i(X_{\alpha_i})$, the function $K(x, R_{max})$, and "smearing" of $\Phi_i(X_i)$ at the bisector. The image of the function $h^2(xy)$ obtained on an optical diffractometer ($k = 0.1$) is also illustrated.

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USSR

UDC 536.46:533.6

ZARKO, V. Ye., MIKHEYEV, V. F., ORLOV, S. V., KHELEVNOY, S. S., CHERTISHCHEV, V. V.

"On the Characteristics of the Ignition of Gun Powder by a Hot Gas"

V sb. Goreniye i vzryv (Combustion and Explosion -- Collection of Works), Moscow, "Nauka", 1972, pp 34-37 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3B933)

Translation: Combustion characteristics are investigated under conditions of conductive and convective heat transfer from a hot gas and the limits of applicability of the thermal theory are determined. The objects of investigation were nitroglycerine gun powder and compressed nitrocellulose. It is shown that there exists a region of condition in which ignition is determined preferentially by the parameters of the solid-phase reactions for substances with a complex reaction mechanism (in the solid and gas phases). The preponderance of gas-phase reactions is achieved under conditions of conductive heating by a rise in pressure (due to ballasting of the reaction mixture by inert gas); under conditions of convective heating it is due to intense escape of gaseous products of

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ZARKO, V. Ye., et al, Goreniye i vzryv, Moscow, "Nauka", 1972, pp 34-37

the decomposition of the high-speed gas flow. The second method of heating is less suitable for the study of nitroglycerine gunpowders and other explosives, the melting temperature (softening, liquefication) of which is lower than the ignition temperature. 5 ref. Authors' abstract.

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1/3 036 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--QUANTUM ELECTRONICS HOLDS DIVERSE PROMISE -U-

AUTHOR--ORLOV, V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW PRAVDA 31 MAR 70 P 2 L

DATE PUBLISHED--31MAR70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MULTISTAGE LASER, LASER INDUCED PLASMA, THERMONUCLEAR REACTION, SEMICONDUCTOR LASER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1981/1429 STEP NO--UR/9012/70/000/000/0002/0002

CIRC ACCESSION NO--AN0051326

UNCLASSIFIED

2/3 036 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0051326

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ACADEMY OF SCIENCES PHYSICS INSTITUTE IS FAMOUS FOR THE FACT THAT IT IS THE CRADLE OF QUANTUM ELECTRONICS. ACADEMICIANS N. G. BASOV AND A. M. PROKHOROV WERE AWARDED THE LENIN AND NOBEL PRIZES FOR DISCOVERING IT. NOW ONE CAN SEE THAT THIS IS PERHAPS THE MOST IMPORTANT REVOLUTION IN WORLD SCIENCE ACCOMPLISHED IN RECENT YEARS. I SEE THROUGH OUR OWN AND FOREIGN PREDICTIONS FOR THE YEAR 2000. EVERYWHERE PEOPLE VIEW QUANTUM ELECTRONICS AS THE MOST IMPORTANT LINE FOR RESTRUCTURING THE POWER INDUSTRY, TECHNOLOGY, AND CONTROL AND COMMUNICATIONS AND AS A VERY KEEN INSTRUMENT FOR COGNIZING AND TRANSFORMING THE WORLD. FANTASISTS DO NOT SPARE THEIR PAINTS IN DEPICTING THE "LASER AGE," WHERE OVER THE GLOBE A WEB OF FINE BEAMS IS SPREAD CARRYING INFORMATION AND ENERGY AND WHERE THE BEAM OF LIGHT HAS BECOME A SWORD AND A PLOW. THEY DO NOT HAVE TO STRAIN THEIR FANTASIES VERY MUCH. THE ENTICING PECULIARITY OF QUANTUM ELECTRONICS IS THAT ONLY SHORT BRIDGES LIE BETWEEN ALMOST FANTASTIC DREAMS OF THE THEORETICIAN AND THEIR PRACTICAL IMPLEMENTATION. IT IS NOT BY CHANCE THAT THE PRESS HAS LONG DESCRIBED THE WONDERS OF LASER TECHNOLOGY: PROCESSING MACHINE TOOLS, SURGICAL INSTRUMENTS, RANGEFINDERS, SUPERACCURATE CHRONOMETERS, CHEMICAL ANALYZERS, TELEPHONE AND TELEVISION LINES, GYROSCOPES WITHOUT MOVING PARTS AND ALSO SENSITIVE ENOUGH SHOW THE MAJESTIC ROTATION OF THE EARTH TO THE NAKED EYE. GIANT AND DWARF LASERS ARE IN OPERATION ON RESEARCH BENCHES AT THE ACADEMY OF SCIENCES PHYSICS INSTITUTE. I REMEMBER THEM IN THEIR CONTRASTING JUXTAPOSITION.

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3/3 036 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0051326

ABSTRACT/EXTRACT--THESE ARE NOW MILESTONES IN THE MOST IMPORTANT DIRECTIONS OF THE MODERN SCIENTIFIC AND TECHNICAL REVOLUTION. HERE IS THE INSPIRING DUGOUT WHERE THE CHERISHED TASK OF ENERGETICS, THE PROBLEM OF THERMONUCLEAR REACTIONS, IS BEING SOLVED BY LASER MEANS. A SUPERPOWERFUL MULTISTAGE LASER HAS BEEN MOUNTED ON A 20 METER OPTICAL BENCH. IT IS A WHOLE "TRAIN" OF ACTIVE RODS MADE FROM NEODYMIUM GLASS REMINISCENT OF AMETHYST RODS. BETWEEN THEM ARE PLACED LIGHT SHUTTERS. THE MAIN CALIBRE LASER GUN FIRES A SHOT. THE SHARP SPEAR OF LIGHT THRUSTS ITSELF INTO THE TINY TARGET. IT IS MADE FROM LITHIUM DEUTRERIDE. A PLASMA CLOUD ERUPTS FROM THE TARGET WITH ENORMOUS SPEED. IT IS PHOTOGRAPHED IN THE LIGHT OF AN AUXILIARY LASER. A COUNTER REGISTERS THE NEUTRON RADIATION, THE FIRST HERALD OF A THERMONUCLEAR REACTION. THE RESULTS ARE REASSURING. ONE HAS ONLY TO INCREASE MANY TIMES THE POWER OF THE LASER. ACADEMICIAN N. G. BASOV SUGGESTS THAT THIS CAN BE DONE. WITH A SUPERPOWERFUL LASER IT WILL PERHAPS BE POSSIBLE TO BUILD COMPACT ACCELERATORS FOR PARTICLES OF UNPRECEDENTEDLY HIGH ENERGY. NOW TO SPEAK ABOUT THE MINUTE SEMICONDUCTOR LASERS WHICH FIT INTO THE FIELD OF VISION OF A MICROSCOPE. HERE THEY FORM INTRICATE CLUSTERS DISTINGUISHED BY MAGICAL QUALITIES. THESE ARE PROTOTYPES FOR THE LOGICAL ELEMENTS OF FUTURE PHOTOCOMPUTERS. THERE ARE MANY GROUNDS FOR SUPPOSING THAT THEY WILL BE MISSIONS OF TIMES FASTER THAN THE FASTEST ELECTRICAL COMPUTERS. TOGETHER WITH LASER ENERGETICS, YET ANOTHER CHANNEL OF TECHNOLOGICAL PROGRESS IS BEING BORN, LASER CYBERNETICS.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--CREATORS OF COSMODROMES -U-

AUTHOR--ORLOV, V.

COUNTRY OF INFO--USSR

SOURCE--PRAVDA, JUNE 30, 1970, P 6, COLS 2-7

DATE PUBLISHED--30JUN70

SUBJECT AREAS--SPACE TECHNOLOGY, ORDNANCE

TOPIC TAGS--COSMODROME, DESIGN BUREAU, ROCKET

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/2008 STEP NO--UR/9012/70/000/000/0006/0006

CIRC ACCESSION NO--AN0109940
UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AN0109940

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ORLOV DESCRIBES HIS VISIT TO A DESIGN BUREAU WHICH HEADS THE DEVELOPMENT PROGRAM FOR THE EQUIPMENT AND MACHINERY USED AT SOVIET COSMODROMES. THE CHIEF DESIGNER OF THIS EQUIPMENT IS DESCRIBED AS "A PROMINENT SCIENTIST, AND ENGINEER OF GREAT EXPERIENCE, AND A STRONG WILLED ORGANIZER OF PRODUCTION". ACCORDING TO ORLOV, ROCKET COMPONENTS ARE DELIVERED TO THE ASSEMBLY TEST BUILDING AT THE COSMODROME IN SPECIAL RAILROAD CARS, AIRPLANES, OR HELICOPTERS. SERVICE BOOMS AT THE LAUNCH PAD ARE OF SEVERAL DESIGNS. SOME, WHICH WERE SHOWN ON TV, ARE DESIGNED AS OPENING PETALS OF A FLOWER, OTHERS RESEMBLE THE SIEGE TOWERS OF OLD. DESCRIBING FUELING SYSTEMS, ORLOV CLAIMS THAT THERE ARE AS MANY DESIGNS OF THESE AS THERE ARE PROPELLANT COMPONENTS USED IN TODAY'S ROCKETS.

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202310014-6"

USSR

UDC: 519.1

GRLOV, V. A.

"On the Complexity of Realizing Conditionally Deterministic Operators by Schemes in Automaton Bases"

Moscow, Probl. kibernetiki--sbornik (Problems of Cybernetics--collection of works), vyp. 26, "Nauka", 1973, pp 141-182 (from RZh-Matematika, No 9, Sep 73, abstract No 9V442 by S. Marchenkov)

Translation: The paper deals with the problem of realizing conditionally deterministic operators by logic networks constructed from Mili (transliterated from Cyrillic Мили) finite automata by using superposition and feedback operations.

A basis in alphabet A is defined as a finite system of automata in alphabet A with a positive number (weight) assigned to each element. Corresponding to each logic network S in basis B is a number $L_B(S)$ equal to the sum of the weights of its elements, and called the complexity of network S. Let Ω be a set of conditionally deterministic operators. Basis B is called Ω-complete if any conditionally deterministic operator from Ω can be realized by a logic network in basis B. In the case where Ω coin-

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CRLOV, V. A., Probl. kibernetiki, vyp. 26, "Nauka", 1973, pp 141-182

cides with the set of all conditionally deterministic operators in the given alphabet an Ω-complete basis is called simply complete. If the set Ω of conditionally deterministic operators is finite and basis B is Ω-complete, the symbol $L_B(\Omega)$ denotes the least number L such that any conditionally deterministic operator from Ω can be realized by a logic network in basis B, whose complexity is no greater than L. The function $L_B(\Omega)$ is called a Shannon function. Let $\Omega^A_{n,m,\lambda}$ be the set of all conditionally deterministic operators in alphabet A which have n input variables, m output variables, and a weight no greater than λ. Let us designate by $M^A_{n,m,\lambda}$ the number of elements of set $\Omega^A_{n,m,\lambda}$. Let us set

$$H^A_{n,m,\lambda} = \frac{\lg M^A_{n,m,\lambda}}{\lg \lg M^A_{n,m,\lambda}}$$

(here and henceforth the logarithm is taken to the base two). The basic result of the first chapter of the paper consists in proof of the following statement:

For any alphabet A containing at least two letters there exists a

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ORLOV, V. A., Probl. kibernetiki, vyp. 26, "Nauka", 1973, pp 141-182

recursive sequence $\{B_i\}$ of complete bases in alphabet A such that when the conditions

1) $n + \lg \lambda \to \infty$,
2) $n + m = o(H^A_{n,m,\lambda})$

are satisfied, the asymptotic behavior of the Shannon function $L_{B_i}(\Omega^A_{n,m,\lambda})$ takes the form $c_i H^A_{n,m,\lambda}$, where c_i is a rational constant, the function $f(i) = c_i$ being noncomputable.

A similar result occurs even in the case of realization of certain (i. e., having weight 1) operators by logic networks in complete automaton bases. (This case involves trivial satisfaction of conditions 1 and 2.)

The proofs of the formulated results are based on modeling the derivation of some system of homogeneous Post products with an algorithmically unsolvable problems of derivability.

The author notes that the methods used in this paper can be used to establish the algorithmic unsolvability of the problem of finding the asymptotic behavior of a Shannon function for many classes of conditionally deterministic operators, as well as in the case of realizing functions by

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ORLOV, V. A., Probl. kibernetiki, vyp. 26, "Nauka", 1973, pp 141-182

formulas in automaton bases. The design of the main theorem enables proving that the Shannon function may be noncomputable for automaton bases containing elements with zero weights.

The second chapter of the paper examines realization of certain (i. e., with weight 1) conditionally deterministic operators in alphabet {0,1} (i. e., in essence, the functions of logic algebra) by logic networks in automaton bases. It is established that the asymptotic behavior of the Shannon function in this instance may depend on many parameters (weight, number of inputs, number of outputs, output function, function of transfers, initial state) of an arbitrarily large number of elements of the automaton basis including single-input elements. According to the author, this dependence occurs also for the case of realization of conditionally deterministic operators with memory in an arbitrary alphabet containing at least two letters. Let us note that in realizing the functions of logic algebra by circuits of functional elements, the asymptotic behavior of the Shannon function depends on the weight of only one element of the basis having at least two inputs (RZhMat, 1961, 2A176).

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UDC 537.591.15

USSR

VERNOV, S. N., Y'EGOROV, T. A., Y'EFIMOV, N. N., KOLOSOV, V. A., KORYAKIN, V. D., KRASIL'NIKOV, D. D., KUZ'MIN, A. I., KULAKOVSKAYA, V. P., MAKSIMOV, S. V., NESTEROVA, N. M., NIKOL'SKIY, S. I., ORLOV, V. A., SLEPTSOV, I.YE., SIZOV, V. V., KHRISTIANSEN, G. B., and SHANSUTDINOVA, F. K.

"Preliminary Results of Recording Extensive Showers on a Recording Array in Yakutsk"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

Abstract: Experiments are described in which attempts were made at determining the energy spectrum, composition, and anisotropy of cosmic rays within the range of energy 10^{17} to 10^{18} ev. It is desired to extend the range to cover 10^{19} ev and above. Of a particular interest are the following problems: do the rays originate within the Galaxy or in metagalactic regions, what is the direction from which they arrive. and how Cerenkov radiation produced by them is distributed within the atmosphere. The test equipment consists of 13 recording points distributed over an area of 3 km², with a central timing control point. The output spectrum was measured over a period of 29.5 hours. 82 showers were noted during that period, with the axes falling within the

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VERNOV, S. N., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

array area. The orientation of the axis was found by the "triangulation" method, comparing the time of arrival of the showers at different recording points. An analytic expression is given in the paper for the integral output spectrum of extensive showers at sea level for the interval of N between 2×10^7 and 2×10^8. The intensity, determined with this formula, appears to be 2 to 3 times as great as recorded elsewhere. Distribution of Cerenkov light with respect to the shower axis was determined by observations conducted on clear, moonless nights. It was found to be similar to that of the primary gamma quanta, but it decayed with the distance from the axis more slowly than the amount of charged particles ($R^{-2.5}$ as against $R^{-3.3}$ for charged particles).

Examination of the energy spectrum of primary particles lead to the conclusion that the electromagnetic component is responsible for 80% of it. Dependence of primary energy on the output N was established, and on the basis of this relation the integral spectrum was computed. The coefficient connecting these two magnitudes was found to be twice as high as the one previously accepted elsewhere.

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VERNOV, S. N., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

In the final analysis, variation of Cerenkov light at the primary particle energy of 3.6×10^{16} ev and the output (intensity) of 1.5×10^{7} particles at sea level is given, as well as the expected distribution of the nuclear components of primary rays.

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USSR

UDC: 8.74

ORLOV, V. A.

"Concerning a Procedure for Arranging Distinctive Features in Pattern Recognition"

Vestn. Belorus. un-ta (Belorussian University Herald), 1972, ser. 1, No 1, pp 31-34 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V574)

Translation: It is shown that as a result of analysis of an initial set of features of objects to be recognized and a heuristic method of arranging these features the characteristics of a recognition algorithm can be improved in spite of a reduction in its complexity. Experiments are presented which confirm the effectiveness of this procedure as compared with the case of arbitrary arrangement of the features. Author's abstract.

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USSR UDC 51:155.001.57:681.3.06

BLOKH, A. Sh., ORLOV, V. A.

"Restoration of Values of Characteristics Upon Recognition of Patterns"

Vestn. Belorus. Un-ta [Herald of Bellrussian University], Series 1, No 1, 1971, pp 40-44, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V824 by the author's).

Translation: Statistical and probability approaches are described for the restoration of unknown values of characteristics during teaching of pattern recognition to machines. Experiments are presented, performed for comparison of these approaches. Comparison is performed on the basis of the relationship to the deterministic case when teaching is performed only using objects, all values of characteristics of which are known. It is demonstrated that restoration of values of characteristics for the teaching sequence improves the quality of teaching.

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USSR UDC 619:616.981.452:636.4

KUSHNIR, A. T., BURTSEV, V. I., BONDARENKO, I. M., ZHOGOLEVA, S. P., SERGEYEV, V. A., FISENKO, O. F., ORLOV, V. A., and TROYAN, N. D., All-Union Scientific Research Institute of Veterinary Virology and Microbiology

"Aerosol Vaccination of Swine Against Swine Fever"

Moscow, Veterinariya, No 10, Oct 70, pp 50-52

Abstract: Cultural vaccine prepared from the 31st passage of the lapinized K strain of swine fever virus in a culture of lamb testicular cells and concentrated 10-fold was highly immunogenic in gilts and piglets vaccinated by the aerosol method. Exposure of the animals for 5 minutes to vaccine diluted 1:1000 with physiological solution conferred stable immunity on 50% of the gilts and 100% of the piglets. Even in a dilution of 1:10,000, the vaccine produced immunity in a number of the animals. The immunizing dose (ImD_{50}) of the vaccine applied via aerosol was equivalent to 7.25 intramuscular ImD_{50} for gilts and 5.25 ImD_{50} for piglets. Clinical-hemoatological and biochemical studies of the vaccination process showed that the time at which the immunological reaction occurred and its intensity were the

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KUSHNIR, A. T., et al, Veterinariya, No 10, Oct 70, pp 50-52

same, regardless of the method of vaccination. The degree of decrease in immunogenic activity of the vaccine in the process of atomization was less than 54.2% for one of the vaccines tested.

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USSR

UDC: 8.74

ORLOV, V. A.

"Organization of Complex Objects"

Probl. Sistemotekhniki. Vyp. 1 [Systems Technology Problems No 1--Collection of Works], Sudostroyeniye Press, 1972, pp 144-153 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V607, by V. Mikheyev)

Translation: The task of equivalent transformation of complex objects into simpler objects, the nature of the interaction of which defines the organization of the complex object, is studied. The object is modeled by a machine with a finite number of states, represented as the interaction of simpler machines. The concept of the structure with external operators and the concept of homomorphism of similar algebraic systems are used. A hierarchical model of a complex object is presented, each element of which (machine or finite automaton) is a part of the object. The same interrelationships are established between elements at neighboring levels between the object and servomechanism. The function of each "object" is defined using sequences of functions of the corresponding "servo-mechanisms." It is noted that the use of multilevel hierarchical models makes it possible to utilize the principle of decomposition in studies of complex objects.

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1/2 012 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--PROTON MAGNETIC RESONANCE SPECTRA OF SOME CHALCONES AND THEIR HETEROCYCLIC ANALOGS -U-

AUTHOR-(04)-TSUKERMAN, S.V., ORLOV, V.D., YATSENKO, A.I., LAVRUSHIN, V.F.

COUNTRY OF INFO--USSR

SOURCE--TEOR. EKSP. KHIM. 1970, 6(1), 67-71

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--MAGNETIC RESONANCE, KETONE, HETEROCYCLIC BASE COMPOUND, FURAN, THIOPHENE, ORGANOSELENIUM COMPOUND, SPECTRUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0909 STEP NO--UR/0379/70/006/001/0067/0071

CIRC ACCESSION NO--AP0137937

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0137937

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NMR SPECTRA OF 18 CHALCONE DERIVS. RCOCH:CHR PRIME, WHERE ONE OF THE R AND R PRIME SUBSTITUENTS IS PH AND THE OTHER IS ME, P,MEC SUB6 H SUB4, PHCH:CH, PENTAFLUOROPHENYL, AND UNSUBSTITUTED OF 5,METHYLATED FURAN, THIOPHENE OR SELENOPHENE RING ATTACHED IN THE 2 POSITION, WERE RECORDED IN CCL SUB4 AND INTERPRETED.

FACILITY: KHAR'KOV. GOSUNIV., KHARKOV, USSR.

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UDC: 547.963.3

USSR

KOROTYAYEV, A. I., MAKSIMOV, V. F., ORLOV, V. G., SHIRYAYEVA, I. N., and ASTAPOV, A. A., Kuban' State Medical Institute, Krasnodar

"Unusual Changes in the DNA Content of Some Escherichia coli Strains in the Process of Growth"

Moscow, Doklady Akademii Nauk SSSR, Vol 194, No 6, 1970, pp 1433-1436

Abstract: The amount of DNA and the rate of synthesis were investigated at different stages of growth of three Escherichia coli strains, K-12S, M, and 026. The DNA content of the K-12S strain increased more than threefold at the end of the lag phase as compared with the control. The M strain differed significantly from the K-12S strain in the dynamics of DNA content. At the start of the lag phase, the M strain contained only one-half to one-third as much DNA as the K-12S strain. The E. coli 026 strain was similar to the M strain in this respect. From the start of the lag phase to the stage of logarithmic growth, the amount of DNA decreased by a factor of ~ 2.5. In K-12S, all of the chromosomes replicated completely, whereas in M and 026 the chromosomes did not replicate completely in either the original or daughter cells. As a result, the rate of DNA synthesis was lower in M and 026 than in K-12S, but there experimental results are preliminary.

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USSR

SPEKTOROV, K. S., KRYLOV, Yu. V., NIKOL'SKAYA, T. V., GROMAKOVSKIY, B. M., and NICHIPOROVICH, A. A., Institute of Plant Physiology imeni K. A. Timiryazev, Academy of Sciences USSR, Moscow

"Changes in Biological and Physiological Properties of Chlorella pyrenoidosa Pringsh. 82 T Cells Cultured in High-Density Cultures at Constant Optical Density"

Moscow, Fiziologiya Rasteniy, Vol 18, No 1, Jan/Feb 71, pp 60-68

Abstract: Chlorella pyrenoidosa Pringsh. 82 T cells were cultured on Tamiya's medium with KNO as a nitrogen source. An increase in the density of the culture up to a certain level had virtually no effect on the productivity per unit of suspension volume, i.e., the system as a whole acquired the character of a "dark" leaf. At the same time, the chlorophyll content of the cells decreased while the potential capacity of their photosynthetic apparatus increased (maximum amount of CO_2 assimilated per mg of chlorophyll per hour under optimum conditions of photosynthesis), i.e., the cells making up the system acquired the character of a "light" leaf. The decrease in chlorophyll content of the cells was highly important for the phytocenosis as a whole because, despite the in-

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UDC 621.375.82

USSR

BAKEYEV, A. A., VAS'KOVSKIY, Yu. M., VOROB'YEVA, N. N., ORLOV, V. K., and ROVINSKIY, R. Ye.

"The Role of a Plasma Torch in the Energy Balance of the Process of the Action of Laser Emission on Materials"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No 2(14), Moscow, "Sov. Radio," 1973, pp 77-80 (English summary) (from RZh-Fizika, No 10, Oct 73, Abstract No 10D899 from authors' abstract)

Translation: The authors measured the energy reemitted by a plasma torch in a wide spectral interval (0.2-4 microns) during the action of laser emission on opaque obstructions. The power density of the incident beam was $\sim 10^6$ and $\sim 10^7$ w/sq cm with retention of the size of the spot on the target. The targets used were duralumin, ebonite, and graphite. It is shown that the energy reemitted by the plasma torch is from 20 to 50 percent of the energy of the laser beam, depending on the material and exposure conditions. The resultant experimental data are used as the basis for evaluating the role of other factors in the energy balance of the action of laser emission on materials. Bibliography with six titles.

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USSR

UDC [621.3.011.2.017.2:621.3.044.3+536.483]001.24

HERTINOV, A. I., ALIYEVSKIY, B. L., SHERSTYUK, A. G., ORLOV, V. L., and ALABIN, G. P.

"Electrical Losses and Resistance of Cryogenic Inductors Allowing for the Magnetoresistance Effect"

Moscow, Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 6, 1972, pp 72-77

Abstract: Powerful magnetic-field inductors based on hyperconductors of very pure metals at cryogenic temperatures are being used in electrical engineering and physics equipment and considered for use in electric power transmission lines. The authors present a graphical analytic procedure for determining the electrical losses P and resistance R of aluminum, beryllium, and copper circular inductor coils of rectangular cross section, allowing for the magnetoresistance effect caused by the transverse plane-meridional coil field. Experimental values of the resistivities as a function of the transverse magnetic field induction at low constant temperatures are used to calculate approximating polynomial functions. The procedure involves 1) selecting coil material coefficients from a table (or precalculating them) in accordance with the operating temperature, 2) finding other coefficients from a family of curves

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BERTINOV, A. I., et al., Izvestiya Akademii Nauk SSSR, Energetika i Transport, No 6, 1972, pp 72-77

based on the coil cross-section outer radius and width, and 3) calculating P and R as a function of the geometrical inductor dimensions, number of turns w, current density, space factor k_z, and above coefficients. A Nayri-2 electronic computer was used in the calculations. The method is illustrated by a cryogenic aluminum-wire solenoid having 1.1 cm and 3.56 cm inner and outer cross section radii, 4 cm width, w = 124, and k_z approximately 0.37. A cryostat with liquid helium at a temperature T = 4.2° K was utilized for the experiments. The authors attribute some difference in the calculated and observed data to unstable magnetoresistance over the winding length. The effect of the intrinsic magnetic field with a 350 A current produces nearly a 6-fold increase in the coil R and P. A simplified peak estimate of the magnetoresistance based on a maximum solenoid induction of about 0.96·T yields a 1.5 fold increase in the resistance by comparison with the actual values. The authors recommend this procedure for engineering use when designing cryogenic inductors.

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USSR UDC 612.822.3+612.821.6

PETUKHOV, V. V. and ORLOV, V. M., Institute of Biophysics, Academy of Sciences USSR, Pushchino-na-Oke

"Chronic Implantation of Electrodes and Recording of Evoked Potentials During the Formation of Conditioned Reflexes in Unrestrained Rats"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti, No 5, 1972, pp 1085-1086

Abstract: Special T-shaped rods to hold the plug and socket unit are inserted into holes (made with a dental drill) in the occipital and frontal bones of the animals and then turned 90° to secure them under the bone. The free ends of the rods projecting above the skull are covered with a quick-setting plastic. The rods remain in place for 1 1/2 to 2 months and the experimental animals can be studied daily during this period of time. The rods do not injure or inflame the dura mater at the site of contact. To permit commutation of the animal with the amplifying apparatus and stimulators, the electrodes are soldered to a special block with the necessary number of contacts.

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USSR

UDC 621.396.6-181.5

GORYUNOVA, N. A., LEONOV, YE. I., ORLOV, V. M.

"Complex Semiconductors -- Prospective Materials in Microelectronics"

Mikroelektronika -- V sb. (Microelectronics -- Collection of Works), No 4, Moscow, Soviet Radio Press, 1971, pp 152-174 (from Zh-Radiotekhnika, No 10, Oct 71, Abstract No 10V178)

Translation: A study was made of the combination of properties in various groups of binary and ternary semiconductor compounds and also solid solutions based on them. The most interesting properties of these groups of materials for microelectronics are presented. An effort has been made to analyze the prospects for application of new semiconductor materials in functional microelectronics and optoelectronics. There are 7 tables and a 30-entry bibliography.

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USSR UDC 621.315.592(088.8)

GORYUNOVA, N. A., ORLOV, V. M., SOKOLOVA, V. I., TSVETKOVA, YE. V., and SHPEN'KOV, G. V., Physicotechnical Institute imeni A. F. Ioffee

"Method of Preparing Copper-, Tin-, and Phosphorus-Base Single Crystals"

USSR Authors' Certificate No 252289, Cl. 12c, 2, (Bol^{d}), filed 11 Jun 68, published 30 Jul 70 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 3G529)

Translation: The method of preparing Cu, Sn-, and P-base single crystals, for example Cu_4SnP_{10}, at high temperatures is unique in that, in order to obtain a semiconductor compound possessing photoelectric sensitivity in the IR region of the spectrum, the crystallization process is carried on from solution in an Sn melt, with charge components taken in the following ratios (wt.%): Cu 36.7-37.7, Sn 17-17,8, P 44.8-46. Phosphorus is taken with an excess of 1-1.5 wt.% as compared with calculations. The process is conducted at 1000-1050° for 1-1.5 hr with subsequent slow cooling at a rate of 20± 5 deg/hr.

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1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--QUANTITATIVE ULTRAMICROANALYSIS OF AMINO ACIDS IN THE FORM OF THEIR DNS, DANSYL, DERIVATIVES. I. APPARATUS FOR ULTRAMICROANALYSIS OF DNS
AUTHOR-(04)-SPIVAK, V.A., ORLOV, V.M., SHCHERBUKHIN, V.V., VARSHAVSKIY, YA.M.
COUNTRY OF INFO--USSR

SOURCE--ANAL. BIOCHEM. 1970, 35(1), 227-34

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--AMINO ACID ANALYSIS, MICROCHEMICAL ANALYSIS, LUMINESCENCE, UV SPECTRUM, CHROMATOGRAPHIC SEPARATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0058 STEP NO--UK/0000/70/035/001/0227/0234

CIRC ACCESSION NO--AP0119054
UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119054

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN APP. IS DESCRIBED THAT PERMITS DETN. OF THE RELATIVE AMTS. FO DNS AMINO ACIDS DIRECTLY IN THE THIN LAYER OF ADSORBANT AFTER CHROMATOGRAPHIC SEPN. THE METHOD OF MEASUREMENT IS BASED UPON THE ABILITY OF THE DNS AMINO ACIDS TO LUMINESCENCE IN THE VISIBLE REGION OF THE SPECTRUM AFTER EXCITATION BY UV LIGHT. THE AMTS. OF DNS AMINO ACIDS ON CHROMATOGRAMS MAY BE AS LOW AS 10 PRIME NEGATIVE11 TO 10 PRIME NEGATIVE10 MOLE. TO ILLUSTRATE THE POSSIBILITIES OF THE PRACTICAL APPLICATION OF THE APP., THE KINETICS OF SPLITTING OFF OF THE C TERMINAL AMINO ACIDS OF RNASE BY CARBOXYPEPTIDASE A WAS INVESTIGATED. THE DATA ARE IN AGREEMENT WITH THE AMINO ACID SEQUENCE IN RNASE. THUS, THE TECHNIQUE OPENS THE POSSIBILITY OF DETG. THE TERMINAL AMINO ACID SEQUENCES IN PROTEINS AND PEPTIDES ON AN ULTRAMICRO SCALE. FACILITY: INST. MOL. BIOL., MOSCOW, USSR.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ON SOME PROPERTIES OF CDSNP SUB2 IN STRONG ELECTRIC FIELD -U-

AUTHOR-(05)-GORYUNOVA, N.A., LEONOV, E.I., ORLOV, V.M., RODIONOV, A.F., SOKOLOVA, V.I.
COUNTRY OF INFO--USSR

SOURCE--PHYS. LETTERS, NETHERLANDS, VOL. 3 1A, NO. 7, P. 393-4, 16 APRIL 1970
DATE PUBLISHED-------7Q

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PHOSPHIDE, CADMIUM COMPOUND, TIN COMPOUND, HIGH FREQUENCY CURRENT, OSCILLATION, ELECTRIC FIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/0441 STEP NO--NE/0000/70/031/007/0393/0394

CIRC ACCESSION NO--AP0111634

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0111634
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HIGH FREQUENCY CURRENT OSCILLATIONS IN A NEW TERNARY SEMICONDUCTING COMPOUND HAVE BEEN PREDICTED THEORETICALLY AND OBSERVED EXPERIMENTALLY. FACILITY: ACADEMY SCI. USSR, LENINGRAD.

UNCLASSIFIED

Acc. Nr: AP0034766 Ref. Code: UR 0241

PRIMARY SOURCE: Meditsinskaya Radiologiya, 1970, Vol 15, Nr 1, pp 53-56

ACUTE RADIATION AFFECTION OF THE HANDS

V. M. Orlov, V. N. Petushkov, L. I. Sych

Summary

The issue contains a detailed destription of severe radiation lesion of the hands in a 49-year-old patient occurring as the result of failure to observe the rules of radiation safety| resulting in direct contact of unprotected hands with Co^{60} granules with an activity of 51 Ra equiv. The exposure dose of gamma-irradiation at the body surface at the level of the chest comprised 150 r, on the region of the hands not less than 10,000 r. The article carries dynamic clinico-physiological data, as well as the results of pathomorphological investigation of amputated segments.

D-R.

Y1

REEL/FRAME 02

USSR

UDC 621.372,413

KURIN, A.F., NOVIKOV, G.P., ORLOV, V.N. [Voronezh State University]

"Open Resonator With Trihedrial Reflector"

Izv. VUZ: Radiofizika, VOl XV, No 5, May 72, pp 766-772

Abstract: The results are described of experimental studies in the millimeter range of an open resonator formed by a pair of reflectors. The reflecting surface of one of them is made with three faces. The other reflector may be cylindrical or flat. The trihedral geometry of the reflector makes it possible without noticeable deterioration of Q to change the size of the angles between the faces and hence to change the distribution within wide limits of the various modes in the cavity of the resonator, and in particular to produce an essentially nonsymmetrical distribution. Specific combinations of the angles between the faces also assure a selection of the types of oscillations of the resonator both with respect to Q and to the distance between them. Measurements were made of two mutually perpendicular polarizations of the exciting radiation. The scheme of the experimental device with a resonator formed by a trihedral and a cylindrical reflector is discussed in detail and the results of the experiment are described. 5 fig. 6 ref. Received by editors, 24 June 1971.

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USSR UDC 599.323.4

ORLOV, V. N., and MALYGIN, V. M., Chair of Vertebrate Zoology, Moscow State University

"Distribution of Twin Species of the Common Vole Near the Zvenigorod Biological Station of Moscow State University"

Moscow, Vestnik Moskovskogo Universiteta, Biologiya, Pochvovedeniye, No 5, 1971, pp 102-103

Abstract: The common vole Microtus arvalis Pall, one of the commonest rodents in the European USSR, was recently found to form two species rather than one. The two are similar morphologically but different in chromosome sets (54 and 46). Their hybrids are sterile. During field trips from 1967 to 1970 some 100 voles were caught in an area covering 20 km^2 near the Zvenigorod Biological Station of Moscow University (fields, meadows, pastures, on the floodplain of the Moscow River, mixed forest on Moscow River terraces and examined karyologically. The 46-chromosome voles were dominant throughout the period under study in all the places investigated. The 54-chromosome mice were found mostly in mixed forest and in a pasture on the left bank of the river. However, although both species occupied a common habitat, they formed isolated colonies with slightly different plant associations. At no time were any individuals of one species caught in the colonies of the other.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202310014-6"

Vector Studies

USSR

UDC 599.323.4 Muridae

MEYER, M. N., ORLOV, V. N., and SKHOLL', Ye. D., Zoological Institute, Academy of Sciences, USSR; Institute of Cytology, Academy of Sciences, USSR and Moscow State University

"The Nomenclature of 46- and 54-Chromosome Voles of the Type Microtus Arvalis (Pall.) (Rodentia, Cricetidae)

Moscow, Zoologicheskiy Zhurnal, Vol 51, No 1, Jan 72, pp 157-161

Abstract: Microtus subarvalis Meier, Orlov, Skholl sp. n., a new species of common vole, is described. Morphologically, M. subarvalis sp. n. is very close to M. arvalis, differing from it only in the set of chromosomes (2n = 54, chromosomes are mostly acrocentric; in M. arvalis 2n = 46, chromosomes are mostly metacentric). Another point of distinction is the shape and dimensions of spermatozoa. Voles with 46- and 54-chromosomes interbreed readily, but always yield infertile progeny. The twin species have extensive ranges, which are to a considerable extent sympatric. M. arvalis apparently has greater distribution, and is encountered in more highly varied landscapes than is the case for M. subarvalis sp. n.

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USSR UDC: 621.374.5(088.8)

ABADULLINA, M. G., ORLOV, V. N., SOKOLINSKIY, A. G.

"A Variable Ultrasonic Delay Line"

USSR Author's Certificate No 266830, filed 11 Nov 68, published 2 Jul 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1G240 P)

Translation: The proposed variable delay line contains an acoustic line in the form of plates of a piezoelectric material and two electrodes, one of which is fixed while the other slides over the surface of a plate. To obtain continuous delay control, the movable electrode is made in the form of two strips of thickness $\lambda/3$ (where λ is the Rayleigh wavelength) displaced with respect to one another by a distance $\lambda/2$, and separated by an insulating gasket of thickness $\lambda/6$.

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1/2 008 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--AT THE 35TH IFLA SESSION -U-

AUTHOR--ORLOV, V.N.

COUNTRY OF INFO--WORLD WIDE

SOURCE--NAUCHN. I TEKHN. BIB-KI SSSR, NR 9 (81),PP. 48-49
REFERENCE--ABSTRACT JOURNAL, REFERATIVNYY ZHURNAL, INFORMATICS, MOSCOW,
DATE PUBLISHED--------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--LIBRARY, INTERNATIONAL CONFERENCE, AUTOMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/0468 STEP NO--UR/0667/70/000/009/0048/0049

CIRC ACCESSION NO--AR0122634
UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AR0122634

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. 35TH IFLA SESSION HELD IN COPENHAGEN CN AUGUST 24-30, 1969, WAS ATTENDED BY 420 DELEGATES FROM 38 NATICNAL LIBRARY ASSOCIATIONS, AND REPRESENTATIVES FROM UNESCO AND FID. THE CONFERENCE WAS CENTERED AROUND LIBRARY EDUCATION AND RESEARCH IN LIBRARIANSHIP. PROBLEMS RAISED BY THE SPEAKERS INCLUDE: THE INFLUENCE OF NEW TECHNICAL FACILITIES ON THE EDUCATION OF LIBRARIANS: PROMOTION OF LIBRARY RESEARCH: LIBRARY REFORMS NECESSITATED BY TENSIVE AUTOMATION AND MECHANIZATION OF LIBRARY OPERATIONS, ETC.

UNCLASSIFIED

Acc. Nr: AP0047204 Ref. Code: UR0504

PRIMARY SOURCE: Terapevticheskiy Arkhiv, 1970, Vol 42, Nr 1, pp 49-54

CRITERIA OF PULMONARY HEART IN ELECTROKYMOGRAPHIC INVESTIGATION

Orlov, V. N.; Gel shteyn, V. E.

Summary

The authors conducted electrokymographic investigation in 85 patients with pulmonary emphysema and diffuse pneumosclerosis. A detailed analysis of the electrokymographic curves and comparison of the data obtained with the results of clinical investigation allowed the authors to elaborate their own classification of changes in pulmonary heart, to single out significant signs of pulmonary hypertension and the ones requiring confirmation. It was shown that the main role in the detection of affections of pulmonary circulation was played by the analysis of the curves of the pulmonary circulation, the right atrium and the right ventricle. To significant signs of pulmonary hypertension there mayae referred. 1) displacement of the dicrotic wave into the upper fourth of the descending limb of the curve, 2) bi-and tri-epical EKI of the pulmonary artery, stipulated by the increase of a dicrotic wave and isometric

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19790704

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AP0047204

knotch, 3) slanting down to the horizontal, a run of EKI in the diastole following the dicrotic wave. The symptoms of pulmonary hypertension on the EKI of the right atrium are in the author's opinion, a considerable increase of the drop amplitude during the systole of the atrium, as well as the appearance of the diastolic plateau.

Moreover, there are seen signs testifying to the intensification or wersening of the contractile activity of the right ventricle, the presence of sclerosis and the pulmonary artery.

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19790705

USSR

UDC 666.113.431.47.32-31.28

BLINOV, V. A., UDOVENKO, N. G., NIKULIN, V. KH., PRUSAKOVA, L. M., SOKOLINSKIY, A. G., ORLOV, V. N., VYSOTSKAYA, Z. I., and CHERNYSHEV, A. V.

"Glass for Ultrasonic Delay Lines"

USSR Author's Certificate No 366156, Filed 26 Jun 70, Published 16 Jan 73 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar (a) 73, Claim No 1453164/29-33)

Translation: A glass for ultrasonic delay lines, including SiO_2, ZnO, BaO, K_2O, is distinguished by the fact that, in order to obtain stable acoustic properties it contains the above components in the following amounts, weight %: SiO_2 49-65; ZnO 5-25, BaO 10.5-30; K_2O 6-25, and furthermore Sb_2O_3 0.05-3.

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ORLOV, V. P.

STRS 5920.8 6-73

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IV-2. ELECTRICAL SURFACE MICRORELIEF CAUSED BY THREE-DIMENSIONAL DEFECTS

[Article by V. V. Terasenko, I. M. Kotelyanskiy, A. Yu. Mityagin, V. P. Orlov and A. A. Telegin, Institute of Radioengineering and Electronics of the USSR Academy of Sciences, Moscow; Novosibirsk, III Simpozium po Protsessam Rosta i Svoystvam Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972, p 41]

It has been demonstrated theoretically that the surface three-dimensional defects (scratches, degree of cleavage or growth, dislocations and faceting) create the local electrical inhomogeneities. The form and magnitude of which are determined both by the configuration of the defect and the electrophysical parameters of the material. The appearance of disturbances of the periodicity of the electric field near the surface defect was caused by the following: 1) disturbance of the periodicity of the ion crystal lattice; 2) elastic deformations; 3) redistribution of the free charge carriers. A study was made of the special cases of ion crystals, metals and piezoelectrics. The experimental studies were made which confirmed the presence of nonuniform electric relief created by three-dimensional surface defects. The effect of the indicated defects on the initial stages of the epitaxial growth of the films and the formation of the transient layer in the case of heteroepitaxial and autoepitaxial growth are discussed.

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USSR

UDC 621.372.82

ORLOV, V. P.

"Nonmatrix Projection Method for Problems in Applied Electrodynamics"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radio Engineering, Electronics and Automation), 1972, vyp.55, pp 61-69 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B85)

Translation: The author presents a modified version of Galerkin's projection method based on the minimization of a functional which is compared to the studied boundary value problem. Algol programs are set up for solving problems associated with a waveguide with a diamagnetic insert and a resonator with a dielectric insert. Original article: four tables and four bibliographic entries. N.S.

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USSR

UDC 621.372.825

ORLOV, V. P.

"Near Electrodynamic Bases for Calculating Waveguides of Complex Form"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radio Engineering, Electronics and Automation), 1972, vyp.55, pp 70-74 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B92)

Translation: The author proposes a method for setting up a vector base for problems associated with waveguides of complex form with a nonuniform filler. This method makes it possible to obtain bases with an electrodynamic structure and which satisfy the boundary conditions on the complex envelope of the waveguide. Random, full systems of functions (for example, the eigen-functions of any Sturm-Liouville problem) serve as the basis. Original article: five bibliographic entries. Resume.

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USSR UDC 621.396.677

ORLOV, YU. I.

"Asymptotic Method for Determining a Field in an Arbitrary, Continuously Nonuniform Medium"

Tr. Mosk. energ. in-ta (Works of the Moscow Power Engineering Institute), 1972, vyp. 119, 82-91 pp (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B6)

Translation: An integral short wave representation was obtained for a field in the case of an arbitrary, continuously nonuniform medium. The method can be used for solving a broad class of problems including waveguide propagation, aperture antennas, and others. Original article: 14 bibliographic entries.

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Semiconductors and Transistors

USSR UDC 621.315.592

KUSTOV, V.G., ORLOV, V.P., PRESNOV, V.A., and AZIKOV, E.S.

"Spectral Photosensitivity of Nonuniform Semiconductors"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, pp 669-672

Abstract: This paper considers the problem of the proper approach to the question of semiconductors with nonuniform distribution of recombination parameters over the crystal volume. In deriving the basic relationships for this situation, the authors assume that there is a clearly expressed monopolar photoconductivity in which monopolar diffusion does not play an important part in the formation of the photoconductivity spectrum. Since there is no bipolar diffusion, the diffusion and drift process limited to the surface are negligibly small. They assume further that the specimen under consideration has a laminar nonuniformity in the direction of generation, with each layer having a specified relaxation time for nonequilibrium majority carriers and a specified absorption factor. The results of computations made from an equation they derive are compared with the experimentally obtained photoconductivity spectrum for GaAs at 77° K; the two are found to agree. The authors conclude that for specimens less than 0.01 cm thick, the probability of the formation of clearly expressed nonlinearities in the photoconductivity spectrum due to local non-

ORLOV, V.S.

JPRS 5308
6-73

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V-6. MICROMECHANISM OF THE PROCESS OF EPITAXIAL GROWTH OF ZINC SULFIDE AND TELLURIDE ON THE GALLIUM ARSENIDE IN THE HYDROGEN FLOW

[Article by M. F. Kovtonyuk, N. M. Kondrashov, V. S. Orlov, G. N. Sarkisov, Moscow; Novosibirsk, III Simposium po Protsessam Rosta i Svoystvam Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972, p 57]

A study was made of the thermodynamic equilibrium in the ZnS-H_2 and the ZnTe-H_2 systems. The partial pressures of the components of the gas phase were calculated as temperature functions. The checking of the thermodynamic calculation by comparison of the calculated and experimental rates of removing the zinc telluride and sulfide by a hydrogen flow from a quasiequilibrium source demonstrated that in the temperature range of 625-975°C the results of the calculation agree well with the thermodynamic equilibrium in the investigated systems.

The processes of transport and growth of zinc chalcogenides in ZnS-H_2 and ZnTe-H_2 systems were studied. A comparison of the experimental deposition rate of zinc sulfide and telluride with the rate calculated by the quasiequilibrium and diffusion models and the observed dependence of the growth rate on the orientation of the substrate indicate that the growth process takes place with respect to a mixed diffusion-kinetic macromechanism. The authors of references [1, 2] arrive at an analogous result when investigating other open zone transport systems.

BIBLIOGRAPHY

1. Yu. M. Ruzyatsev, F. A. Kuznetsov, Izv. SOAN SSSR. Ser. khim. nauk (News of the Siberian Department of the USSR Academy of Sciences, Chemical Sciences Series), No 9, vyp. 4, 49, 1969.

2. L. M. Kotelyanskiy, Izv. AN. SSSR. Neorgan. mater. (News of the USSR Academy of Sciences, Inorganic Materials), No 7, 925, 1971.

ORLOV, K.S.

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XIV-17. EFFECT OF THE TECHNOLOGICAL PARAMETERS ON THE EPITAXIAL GROWTH OF LAYERS OF THE GaAs-GaP SOLID SOLUTION

[Article by N. F. Kovtonyuk, N. M. Kondaurov, K. S. Orlov, Moscow; Sverdlovsk, III. Simpozium po Fizicheskim Osnovam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 207]

The synthesis of the $GaAs_{1-x}P_x$ solution was carried out in a flow reactor from the initial gas solution ($H_2 + H_3As + H_3P$)-($GaCl_3 + HCl$) on a substrate of Gallium arsenide with the orientation (111) and (100).

Results are presented from an experimental study of the growth kinetics of the epitaxial layers of the solid solution as a function of the structural characteristics of the reactor, the concentration of the gas solutions fed into the synthesis zone, the velocity of the aggregate gas flow above the substrate, and the relative velocities of the flows of the individual gas components forming the gas mixture in the deposition zone, the temperature in the deposition zone of the layer and the source zone of the volatile gallium compound.

Experimental data are presented on the etching kinetics of Gallium arsenide using various gas mixtures occurring under specific conditions of the investigated system.

The optimal construction of the reactor and the technological parameters of the deposition process are proposed for a layer of solid solution of $GaAs_{1-x}P_x$ ($x = 0.3$) with a growth rate on the order of 90 microns/hour and for arsine and phosphine consumptions per cycle less than 100 cm³/hour. The low consumption of hydrides in the given case is caused by the fact that the synthesis is carried out from highly diluted initial gas solutions of $H_3As + H_2$, $H_3P + H_2$.

USSR

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UDC 621.315.592:546.19'681

KOVTONYUK, N. F., KURBATOV, L. N., NOZDRIN, V. V., ORLOV, V. S., RYABENKO, Ye. A., RASKIN, A. A., ROSTUNOVA, R. P., SOLOV"YEV, A. A., SEVAST'YANOV, V. G., UMNYAGIN, A. M., SHALUMOV, B. Z., and SHAULOV, Yu. Kh.

"Some Problems of a Technological Formulation of the Process of Obtaining Epitaxial Films of Gallium Arsenide by the Gas Phase Method"

V sb. Protsessy rosta kristallov i plenok poluprovodn. (Procedures for the Growth of Semiconductor Crystals and Films -- Collection of Works), Novosibirsk, 1970, pp 341-350 (from RZh-Elektronika i yeye primeneniye, No 7, July 1971, Abstract No 7B130)

Translation: The epitaxial films of GaAs obtained were produced by the gas phase method with the use of AsH_3, Ga, and HCL. GaAs wafers served as substrates. The surface of a wafer was subjected to chemical--mechanical processing and etching with H_2SO_4: H_2O_2: H_2O in the ratio 3: 1: 1. Synthesis of the GaAs was conducted in a reaction apparatus which was thoroughly scavenged by H_2 and etched by HCl at 950° C for 30 minutes. After cooling, the Ga was loaded into the chamber. The chamber was heated to a temperature of 850° C for activation of the Ga surface. After reduction of the temperature to 100--150° C, the GaAs substrate was introduced into the reaction zone. After heating the Ga area and the GaAs area, etching of the GaS was performed by HCl gas in a stream of AsH_3 and H_2. The films were doped by Se.

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USSR

KOVTONYUK, N. F., et al., Protsessy rosta kristallov i plenok poluprovodn. (Procedures for the Growth of Semiconductor Crystals and Films -- Collection of Works), Novosibirsk, 1970, pp 341-350 (from RZh-Elektronika i yeye primeneniye, No 7, July 1971, Abstract No 7B130)

The best specimens of film had n-type conductivity and a mobility of 4000--5000 cm^2/v.sec. Films doped by Se had a concentration of $5 \cdot 10^{17}$-- $5 \cdot 10^{18}$ at/cm^3 and a mobility of 2000 cm^2/v.sec. 8 ref. V.B.

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Foundry

USSR UDC 669.185.1

NIKIFOROV, B. V., SMOKTIY, V. V., GUL'YEV, G. F., ORLOV, V. S., SIZENKO, A. S., SAFRONOV, YU. YA., KOLESNIK, V. D., BASHMAKOV, YU. V., RUDNITSKIY, YA. N., FAYERSHTEYN, A. D., KAGAN, I. I., Institute of Ferrous Metallurgy in Dnepropetrovsk and Krivoy Rog Metallurgical Plant

"Operating Experience With a 55-Ton Converter With Increased Blowing Rate"

Moscow, Stal', No 3, Mar 70, pp 215-218

Abstract: Metallurgists of the Institute of Ferrous Metallurgy in Dnepropetrovsk and Krivoy Rog Metallurgical Plant have developed a technique for smelting in 55-ton converters with the oxygen feed rate almost doubled from 2,8-3 to 5-6 cu m/t per minute. A new-type tuyere is used, the nose of which has two rows of concentrically arranged nozzles with independent oxygen feed to each row. The increased blowing rate improves slag formation. The yield of acceptable product and the degree of improvement in slag formation are determined by the structural characteristics of the noses. Nose No. 5 was found to be

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202310014-6"

USSR

NIKIFOROV, B. V., et al., Stal', No 3, Mar 70, pp 215-218

the most effective of all those tested. The use of a tuyere with nose No. 5 reduces the blowing time by 40 percent and increases converter productivity by 20.5 percent. Steels K St. 5sp, K St. 3sp, 35GS, K St. 5 ps, K St. 3ps, K St.0m, 08kp, 10kp, K2, K3, KExp., K3khr, T, and Sv-08A were obtained without any decrease in the yield of acceptable product, deterioration of metal quality, or decrease in refractory lining resistance. In newly designed shops provision should be made for a gas circuit capacity and oxygen feed system sufficient for the operation of converters with a blowing rate of 5-6 cu m/(t. min).

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USSR

UDC 621.039.538

ORLOV, V. V., SUVOROV, A. P.

"Current State of Methods for Calculating Parameters of Radiation Shielding of Reactors"

V sb. Vopr. fiz. zashchity reaktorov (Problems in Reactor Safety Physics -- Collection of Works), No. 5, Moscow, Atomizdat, 1972, pp 7-21 (from RZh-50. Yadernyye reaktory, No 5, May 72, Abstract No 5.50.66)

Translation: Problems which must be solved in the process of designing a reactor shield have by now been determined to a considerable degree. Among these are the passage of radiation in media with a one-dimensional geometry, the passage of radiation in media with two- and three-dimensional geometries consideration of multidimensional heterogeneities, the distribution of radiation in media with cavities, reflection of radiation from the media, the angular distribution of radiation coming from the shield, and optimization of the shield design using modern mathematical methods and computers. Each of these problems requires the development of special computational methods and the development of special computer programs to a greater or lesser degree.

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USSR

KAZACHENKOV, Yu. N.; ORLOV, V. V.

"Neutron Diffusion in a Polarized Proton Medium"

Moscow, Atomnaya Energiya; April, 1972; pp 297-300

ABSTRACT: This article concerns neutron diffusion in polarized proton screens. The authors derive a set of equations which describes the neutron transfer, taking into account spin-spin interaction. The albedoes of polarized proton reflectors are shown to be less than those of similar nonpolarized reflectors. As an example, the authors carry out a calculation for a plane, infinite plutonium reactor having a 6-cm-thick water reflector. It has been found that the effective multiplication constant of a reactor having a polarized reflector is 2.7% less than that of a reactor having a similar nonpolarized reflector. In pulsed operation the smallest pulse half-width obtainable in a reactor having a polarized reflector is 1 μsec.

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USSR

KAZACHENKOV, Yu. N. and ORLOV, V. V., Atomnaya Energiya, April 1972, pp 297-300

The authors propose a method for regulating such a reactor by providing a magnetic field normal to the screen polarization. In this case the albedo of the reflector is shown to increase and the corresponding effect to be directly proportional to the square of the magnetic field strength. Providing a magnetic field strength of about 13,000 oersteds is equivalent to decreasing the polarization of the reflector by a factor of two.

The article includes 18 equations and a figure showing the geometry for calculating the neutron polarization. There are 7 bibliographic references.

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AA0047858

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 1-70

243437 ABRASIVE FINISHING of workpieces is carried out in a closed chamber 1 with entry 3 for the component 4, and rod 5 of the nozzle control. The shot blast nozzles 6 are with crossed axes, and rod 5 is supported on guide rollers 7 of carriage 8 which can vertically move on upright 9 by drive mechanism 10. The workpiece is clamped on carriage 11, and the shot is fed by hoses 13, the return ensured by tank 15 and an elevator.

A-A

25.4.68. as 1238067/25-8, ORLOV, V.V. PETROVA, T.V. (15.9.69) Bul. 16/5.5.69. Class 67b, Int. Cl. B 24c.

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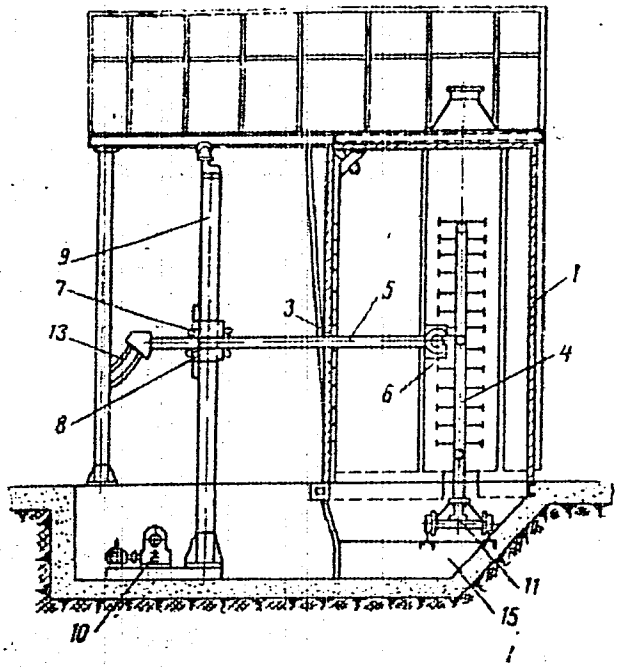
18

AA0047858



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USSR

UDC 621.372.543.2(088.8)

BRAUDE-ZOLOTAREV, YU. M., ORLOV, V. V.

"Band Filter"

USSR Author's Certificate No 248858, Filed 3 May 67, Published 15 Jan 70 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D41P)

Translation: This author's certificate introduces a band filter (for example, for intermediate frequency amplifiers of TV-receivers) containing rejector circuits (rejectors), coupling circuits, resistive capacitors and resonance matching circuits at the input and output. In order to improve the selectivity when decreasing the number of regulated elements, the filter (Ф) is executed in the form of two rejectors included in parallel in the middle of the filter and connected via a nonregulatable coupling capacitance with a low-frequency rejector at the filter input and via an unregulated coupling inductance with a high frequency rejector at the filter output. Resistors are included between the matching circuits at the input and output of the filter and the parallel rejectors.

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1/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--DISSOCIATION OF NORMAL PARAFFINS AND SOME OTHER HYDROCARBONS DURING IONIZATION BY METASTABLE ATOMS OF INERT GASES AND BY ELECTRONS -U-
AUTHOR--ORLOV, V.YU.

COUNTRY OF INFO--USSR

SOURCE--KHIM. VYS. ENERG. 1970, 4(3), 276

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--IONIZATION, ALKANE, TOLUENE, INERT GAS, ELECTRON BOMBARDMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605012/E05 STEP NO--UR/0456/70/004/003/0276/0276

CIRC ACCESSION NO--AP0140309

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0140309
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DISSOCN. IONIZATION OF 8 N ALKANES (WITH C SUB8-C SUB20 ATOMS), PHME, P C SUB6 H SUB4 ME SUB2, AND PHCH SUB2 CH SUB2 PH WAS STUDIED IN COLLISIONS OF THE ABOVE MOLS. WITH METASTABLE ATOMS OF INERT GASES (MAINLY A AND KR) AS WELL AS IN THEIR BOMBARDEMNT WITH ELECTRONS. THE MECHANISM OF DISSOCN. WAS THE SAME IN BOTH CASES. THUS, THE IONIZATION USING METASTABLE ATOMS OF INERT GASES CAN BE USED INSTEAD OF THE PHOTOIONIZATION MASS SPECTROMETRY TO DET. THE MECHANISM OF ELECTRON IMPACT IONIZATION. THE ENERGETICS OF THE FORMATION OF FRAGMENTATION IONS WAS INVESTIGATED. FACILITY: FIZ.-KHIM. INST. IM. KARPOVA, USSR.

UNCLASSIFIED

USSR

UDC 51

ORLOV, YA. I.

"U-Optimal Trajectories of Models of Economic Dynamics"

Sb. tr. In-t mat. Sib. otd. AN SSSR (Collection of Works of Mathematics Institute of Siberian Department of Academy of Sciences USSR), 1971, vyp. 2(19), pp 169-181 (from RZh-Matematika, No 5, May 72, Abstract No 5V447 by V. MALINNIKOV)

Translation: The article considers the problem of the maximization of total utility in a comsumption model. Necessary conditions for trajectory optimality are presented. Particular cases resulting during the concrete definition of mappings are dealt with in greater detail.

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USSR UDC: 51

ORLOV, Ya. I.

"U-Optimum Trajectories in Models of Economic Dynamics"

Sb. tr. In-t mat. Sib. otd. AN SSSR (Collected Works. Institute of Mathematics, Siberian Department of the Academy of Sciences of the USSR), 1971, vyp. 2(19), pp 169-181 (from RZh-Kibernetika, No 5, May 72, Abstract No 5V447)

Translation: The author considers the problem of maximum overall utility in a model with a consumer. Necessary conditions are presented for the optimality of a trajectory. Special cases resulting from concretization of representations are considered in more detail. V. Malinnikov.

1/1

USSR

UDC: 616.831-073.97

ORLOV, Ye. F., BARANOVA, I. A., RAKOV, I. S., and RODINA, I. V., Scientific Research Radiophysics Institute, Gor'kiy

"A Method of Investigating the Spatial Dependence of the Spectral Components of Electroencephalograms"

Moscow, Meditsinskaya tekhnika, No 1, 1973, pp 10-13

Abstract: Since the problem of parallel spectral analysis of electroencephalograms (EEG) for a large number of channels with measurement of phase differences in individual spectral components after narrow-band filtration is an interesting one, this paper proposes a device for solving the problem. Optical analog systems of this type have the advantage of operational speed in addition to multichannel application, and are thus especially useful for EEG analysis. In the final stage of this equipment, a schematic of which is shown, the results of the multichannel Fourier analysis is shown on the screen of a television kinescope with frequency measured along the x axis and the channel number along the y. The equipment is explained, and the mathematical analysis for a single channel given. A sample of eight-channel EEG spectra obtained with the device is shown.

1/1

Thermomechanical Treatment

USSR

UDC: 539.4.011

SHAKHNAZAROV, Yu. V., TIKHOMIROV, V. V., ORLOV, Ye. D., and VOROB'YEVA, N. I., Leningrad

"Combined Effect of Alloying and High-Temperature Thermomechanical Treatment on the Resistance of Low-Tempered Martensite to Brittle Failure"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 124-127

Abstract: This study involved arc furnace-melted steels 40, 40Kh, 40KhS, 40KhSN, and 40KhSNMF. The steels were quenched from 870°C (heating in a salt bath for 6 minutes, oil). The high-temperature thermomechanical treatment (HTTMT) was effected by rolling in shaped rolls at 900°C with deformation of about 50%. The tempering temperature was such as to insure a tensile strength of 190-215 kg/mm^2. HTTMT is shown to increase the resistance of low-tempered steels (varying in degree of alloying) to brittle failure; it was also found to level off the differences in notch and crack sensitivity. HTTMT increases the crack-propagation resistance

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USSR

SHAKHNAZAROV, Yu. V., et al, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 124-127

of low-tempered martensite through changes in the macrostructure of the fracture. The tangible differences in the values of the pair coefficients of correlation between the notch sensitivity characteristics demonstrate that the latter are not interchangeable in evaluating the resistance of low-tempered martensite to brittle failure.

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ORLOV, Ye. I.

data control systems

JPRS 56233

12 June 1972

UDC 681.3

MONITORING THE OPERATION OF COMPLEX DATA CONTROL SYSTEMS WITH HIERARCHIC STRUCTURE

[Article by Ye. I. Orlov; Leningrad, Izvestiya Vysshikh Uchebnykh Zavedeniy, Priborostroyeniye, Russian, Vol 15, No 3, 1972, signed to press 29 June 1971, pp 59-64]

The problem of selecting the optimum period for monitoring the condition of complex data control systems is examined. A simulating algorithm of step-by-step optimization is described for determining the maximum possible time of monitoring ACS (automatic control systems) with limitation on the probability of tolerable losses of the data system.

Data automatic control systems (ACS) are now being employed more and more, ACS are designed for the collection, processing, storage and readout of data.

The i-th ($i = 1, 2, \ldots, n$) unit of ACS includes EVM [electronic computer] (systems [2]), data transmission equipment and other radio electronic systems. Practice has shown that the problem of monitoring complex ACS should be solved by methods of systemology, systems analysis and analysis of systems operations in complex (large) systems [4, 5, 6]. During the execution of functional operations in an ACS its condition is monitored on the basis of the criterion "normal" (operative)-"not normal" (inoperative) $n \geq 2$ times (figure 1). The shaded areas in the figure are monitoring periods used for determining the condition of the ACS.

We will introduce the definitions:

$t_i^{(m)}$ -- the time of beginning of the i-th ($i = 1, 2, \ldots, n$) ACS monitoring session;

$\delta\tau^{(m)}$ -- the time required for one ACS monitoring session

$\tau^{(m)}$ -- ACS monitoring period (time between two consecutive monitoring sessions);

USSR

UDC: 681.3.007

ORLOV, Ye. I., Candidate of Technical Sciences

"Systems Operations in Information Control Systems With Hierarchical Structure"

Moscow, Pribory i Sistemy Upravleniya, No 6, Jun 70, pp 5-8

Abstract: This article presents an analysis of a list of typical systems operations realized in information control systems with hierarchical structure. Operations studied include systems operations of relationship (local operations), global operations, the operation of generalized control, the operation of combined functional testing of the system, the operation of realization of a "large load" in the system, and the operation of combined testing of the information system.

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USSR

UDC 615.381.011.3:532.13

KAVESHNIKOV, A. I., SETT, A. V., URATKOV, Ye. F., ORLOV, Ye. S., STRUCHKOVA, K. I., POLUSHINA, T. V., and SUSOVA, G. M., Department of Experimental Traumatology and Orthopedics, Central Institute of Traumatology and Orthopedics, Ministry of Health USSR, and Laboratory of Blood Substitutes and Fractionation of Blood Proteins, Central Institute of Hematology and Blood Transfusion, Moscow

"Changes in the Viscosity of Blood After Dilution with Different Blood Substitutes Under Hypothermia Conditions"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 70-75

Abstract: Changes in the viscosity of blood were studied after dilution at different temperatures with the following solutions: Ringer Locke, glucose, polyglucine [form of dextran], rheopolyglucine, low-molecular weight dextran, and polyvinyl-pyrrolidone. The tabulated results can be used as a basis for selecting a blood substitute and degree of blood dilution in

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USSR

KAVESHNIKOV, A. I., et al., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 70-75

relation to perfusion temperature. A mathematical formula is proposed for calculating the viscosity of the solution in blood dilution in relation to the hematocrit index, temperature and viscosity of the blood substitute. It is concluded that in case of normothermal perfusion or slight chilling, any of the solutions studied can be used. But under low-temperature conditions, when water moves from the interstitial and intracellular spaces, it is preferable to use rheopolyglucine, low-molecular-weight dextran, or low-molecular-weight polyvinylpyrrolidone because they decrease the viscosity of the perfusate more than the others.

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USSR UDC 639.3.045

MAKHLIN, M.; ORLOV, Yu.

Moscow, Emblema s Letyashchey Ryboy (Emblem With a Flying Fish), "Pishchevaya Promyshlennost'," 1971, 168 pp

Translation: Annotation: Fourteen seas, hundreds of thousands of lakes and rivers, numerous water reservoirs -- these are the richest water resources of the Soviet Union. Relationships among the inhabitants of these bodies of water have been developing for millions of years.

Is it possible to penetrate the mysterious secrets of these historical relationships and influence them in a manner that will increase the productivity of the bodies of water and will improve the species composition of the animals?

Working on the solution of this problem are hydrobiology acclimation specialists.

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USSR

MAKHLIN, M., et al, Emblema s Letyashchey Ryboy, "Pishchevaya Promyshlennost'," 1971, 168 pp

The subject of this book is hydrobiology acclimation specialists -- people of a rare profession who are concerned with the purposeful distribution of fish, gradual extension of the zone of hydrobiological organism as a result of canals being dug and increase in marine shipping, potent useful and harmful biological explosions, and attempts to regulate these explosions.

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USSR

MAKHLIN, M., et al, Emblema s Letyashchey Ryboy, "Pishchevaya Promyshlennost'," 1971, 168 pp

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USSR

MAKHLIN, M., et al, Emblema s Letyashchey Ryboy, "Pishchevaya Promyshlennost'," 1971, 168 pp

USSR

MELIKyAN, R. A.; ORLOV, Yu. F.; KhEYFETs, S.A.(Yerevan Institute of Physics)

"A Quantum Theory of Electron Movement in a Synchrotron, Taking into Account an Autophasing Field. I. Wave Functions"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Fizika, Vol 8, No 2, 73, pp 85 - 92

Abstract: Since the existence of quantum transverse oscillations of moving particles in magnetic and electric fields was revealed, a number of studies have examined the nature of these oscillations. However, none of these works considered an accelerating electric field and the synchrotron oscillations of the particles related to this, nor was there a quantum analysis of the longitudinal oscillations. This study assumes 2-dimensional movement for simplicity and ignores spin effects, reducing the problem to a solution of the Klein-Gordon equation. Wave functions and energy levels are found for particles moving in a non-uniform, constant, axially symmetric magnetic field and in a field of autophased electromagnetic waves whose phase velocity is close to the velocity of the particles.

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ORLOV, Yu. F.

XVI-14. THEORETICAL AND REAL LAWS OF FORMATION OF THIN SEMICONDUCTOR LAYERS OF COMPLEX COMPOSITION MANUFACTURED BY THERMAL EVAPORATION IN A VACUUM

(Article by Yu. F. Orlov, L. E. Tyrilin, Ye. O. Kurchevskaya, L. A. Pashkova, V. M. Lagodinskiy, Leningrad Technological Institute imeni Lensovet)

In: Sintez Poluprovodnikovykh Kristallov i Plenok. Russian, 12-17 June 1972. p 233)

The simplest method of manufacturing thin layers of complex composition comprising two components, for example, As_2Se_3-Tl_2Se, is evaporation in a vacuum from one evaporator of liquid melts or mixtures from the solid phase.

The variations in the layer composition were calculated as a function of the proportion of evaporated melt. It was demonstrated experimentally (the Se-As_2Se_3, As_2Se_3-Tl_2Se melts, and so on) that the real laws of the formation of the layer composition are close to the calculated laws if convection mixing proposed by the calculation takes place in the evaporator.

The variations in composition of the layers as a function of the evaporated substance were calculated for sublimation of mechanical mixtures. In the example of PbS-S it was demonstrated that under real conditions the layer of material in the evaporator has significant resistance to the vapor flow. In the example of sublimation of a number of mixtures (Sb_2S_3-Sb_2O_3, and so on) it was demonstrated that there is a qualitative correspondence between the theoretically calculated and real laws of formation of the layer composition.

The operative results permit determination of the evaporation conditions insuring the given nature of distribution of the components with respect to the thickness of the layers.

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USSR UDC 669.14.018.25:621.762

DOROFEYEV, Yu. G., PETROV, A. K., TSIPUNOV, A. G., USTINENKO, V. I. MARINENKO, L. G., BATENEVA, M. K., and ORLOV, Yu. G., Novocherkassk Polytechnic Institute, Ukrainian Scientific Research Institute of Special Steel

"Structure and Properties of R18 Cermet Steel"

Kiev, Poroshkovaya Metallurgiya, No 2 (122), Feb 73, pp 56-60

Abstract: Results are presented of investigations of the production of R18 high-speed cermet steel from pulverized powders by the method of dynamic hot-pressing. Steel productions using plasticizers and production in thin-sheet metal containers are investigated. The established optimum conditions for dynamic hot-pressing of R18 steel are as follows: heating temperature 1250-1280°C, reduced pressing work 25-30 kgm/cm^3, aging time 10 min. The produced steel was practically without pores, it had a homogeneous microgranular structure corresponding to the structure of hardened steel, and it was without carbide liquation. Cutters of R18 cermet steel had a resistance twice as high as that of standard R18 steel. Three figures, seven bibliographic references.

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USSR

UDC 621.762.224:669.14.018.253

PETROV, A. K., LEVITIN, V. V., MIROSHNICHENKO, I. S., AKIMENKO, V. B., ANDREYEVA, A. YA., BATENEVA, M. K., GOLOVKO, V. A., LABUNOVICH, O. A., ORLOV, YU. G., and ORMAN, R. Z., Ukrainian Scientific Research Institute of Special Steels, Alloys and Ferroalloys, Dnepropetrovsk State University

"Study of Atomized Powders of High-Speed Steel and Blanks Made of Them"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 9-14

Abstract: This work was performed in order to study the structure of powders of high-speed steel produced by atomizing of liquid steel with a stream of pure argon applied to a stream of metal through a slit diaphram at a pressure of 6-8 atm. For comparison, one melt was atomized using compressed air at 14-16 atm under industrial conditions. The structure and phase composition of the initial powder, powder after heat treatment, and blanks made from the powder were studied. Blanks produced by

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USSR

PETROV, A. K., et al., Poroshkovaya Metallurgiya, No 3, Mar 71, pp 9-14

hydrostatic pressing with subsequent sintering had a fine-grain structure with evenly distributed carbides. The structure corresponded to a hardness of 65 HRC after tempering at 560° and 61 HRC after tempering at 620°. This indicates the possibility of producing blanks from atomized powders of high speed steel.

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USSR

UDC: 621.371:551.510.535

ORLOV, Yu. I., ANYUTIN, A. P.

"Propagation of Radio Waves in the Spherical Ionosphere With Horizontal Gradients"

Tr. Mosk. energ. in-ta (works of Moscow Power Engineering Institute), 1972, vyp. 119, pp 92-103 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12A278 by N. S.)

Translation: A model is proposed for a two-dimensionally nonhomogeneous ionospheric layer which can be used for solution of the formulated problem. By using this model, expressions are derived for the principal parameters of a beam trajectory -- the skip range, and the phase and group paths within the limits of a single skip. These results are applied to the case of a quasiparabolic model of the ionosphere with quasilinear variation of the electron concentration in the horizontal direction. Four illustrations, bibliography of seven titles.

1/1

USSR UDC 666.189.2.:535.8

SATTAROV, D. K., ORLOV, Yu, P., IVANOVA, L. N., IVANOV, V. A.

"The Use of Round Multiple-Strand Light Conductors for the Production of Pressed Optical Fiber Elements"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No. 5, 1970, pp 43-46

Abstract: It is shown that round multiple-strand light conductors are suitable for the production of vacuumtight thermally pressed optical-fiber elements with a relatively low uniformity of the optical parameters with respect to the field of the part.

The experiments conducted show that circular multiple-strand light conductors made up of thin (0.3 mm diameter) fibers and having a final diameter of 2-3 mm are preferable.

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USSR

UDC 621.039.538:539.125.5

VASIL'YEV, G. A., VESELKIN, A. P., YEGOROV, Yu. A., ORLOV, Yu. V., PANKRAT'YEV, Yu. V., PISKUNOV, V. I.

"Space-Energy Distribution of Reactor Neutrons in Metal Hydrides"

V sb. Vopr. fiz. zashchity reaktorov (Problems in Reactor Safety Physics -- Collection of Works), No. 5, Moscow, Atomizdat, 1972, pp 91-105 (from RZh-50. Yadernyye reaktory, No 5, May 72, Abstract No 5.50.58)

Translation: Current designs of the shielding of nuclear reactors include hydrogen-containing materials, the presence of which in the shield makes it possible to shorten the size of the shielding and reduce the contribution to the power of the dose from neutrons of intermediate energies. Various hydrogen-containing materials are used in the shield: water, polyethylene, paraffin, concretes with an increased concentration of hydrogen such as Serpentinite concrete, etc. Metal hydrides may also be included in such materials. Metal hydrides have a high nuclear density of hydrogen, in some cases exceeding the nuclear density of hydrogen water. In studying the passage of neutrons through metal hydrides, one can show the perturbing

USSR

VASIL'YEV, G. A., et al, Vopr. fiz. zashchity reaktorov, No. 5, Moscow, Atomizdat, 1972, pp 91-105

effect of the metal nuclei on the form of the attenuation function or the form of the energy distribution of neutrons, and he can also show the role of the metal in the accumulation of moderating neutrons. The problem of the passage of neutrons through lithium, magnesium, titanium, and zirconium hydrides was investigated. The experiments were conducted on a water cooled - water moderated research reactor. 8 ill., 8 tables, 37 ref.

USSR

ORLOV, YU. V., Nuclear Physics Institute, Moscow State University

"Analysis of (p,d) Reactions in Peripheral Model Taking Nuclear Form Factor into Account"

Moscow, Yadernaya Fizika, Nov 73, pp 1028-1033

Abstract: The author calculates the differential cross section for the reaction B(p,d)A in a peripheral model in order to learn the effects of taking into account the dependence of the nuclear vertex part $B \rightleftharpoons A + n$ of the pole graph on the momentum transfer. The calculations are made with and without the form factor and are compared with experimental data for the reactions $O^{18}(p,d)O^{17}$ (0.87 mev, $\frac{1}{2}^+$) and $F^{19}(p,d)F^{18}$ (over a wide energy range in the last case). It is found that the extracted coupling constant G^2 (the square of the vertex part of the mass surface) can increase by a factor $\lesssim 2$ at proton energies $\lesssim 60$ mev. The form factor was calculated for the one-particle model. The article includes four equations, five figures, and a table. There are 11 references.

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USSR

UDC 621.039.538

BOLDYREV, G. N., VESELKIN, A. P., YEGOROV, Yu. A., YEMEL'YANOV, I. Ya., ZHIRNOV, A. D., ORLOV, Yu. V., KONSTANTINOV, L. V.

"Study of the Shielding Problems on Water Cooled - Water Moderated Research Reactors"

V sb. Vopr. fiz. zashchity reaktorov (Problems in Reactor Safety Physics -- Collection of Works), No. 5, Moscow, Atomizdat, 1972, pp 235-250 (from RZh-50. Yadernyye reaktory, No 5, May 72, Abstract No 5.50.62)

Translation: Several special installations were constructed to study shielding. The BSF and GTR installations were swimming pool reactors employing 1 and 3 Mw neutrons, respectively, placed on moving bridges in large water pools. The B-2 device on the BR-5 reactor was developed to study the laws of the attenuation of γ-quanta and reactor neutrons in the geometry of a unidirectional beam; the materials to be studied or models of the shielding were placed in a niche in the reactor shielding. A zero-power reactor was intended for studying processes in the shield directly adjacent to the reactor core. The reactor was equipped with filters in one of the directions making it possible to obtain an optimal relationship between the neutron and

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USSR

BOLDYREV, G. N., et al, Vopr. fiz. zashchity reaktorov, No. 5, Moscow, Atomizdat, 1972, pp 235-250

γ-quanta fluxes. The OR-M experimental device is also intended for studying problems in reactor shielding. The 50-kw water cooled - water moderated research reactor is also equipped with devices for conducting experiments on shielding. Various studies associated with the radiation problems of shielding are carried out on this reactor. A description of the reactors, experimental devices, and characteristics of the devices and methods used in the research are given.

1/2 035 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--BACKSCATTERING OF NEUTRONS FROM ALUMINUM, TITANIUM, GRAPHITE, AND POLYETHYLENE -U-

AUTHOR-(02)-ZHARKOV, V.P., ORLOV, YU.V.

COUNTRY OF INFO--USSR

SOURCE--YEGOROV, YU. A.

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--NEUTRON SCATTERING, ALUMINUM, TITANIUM, GRAPHITE, POLYETHYLENE, ANGULAR DISTRIBUTION, SPECTRAL DISTRIBUTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1047 STEP NO--UR/0089/70/028/002/0170/0172

CIRC ACCESSION NO--AP0124705

UNCLASSIFIED

2/2 035 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0124705

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SPECTRAL ANGULAR DISTRIBUTION OF N (FROM A WATER COOLED, WATER MODERATED REACTOR) REFLECTED FROM AL, TI AND POLYETHYLENE ARE PRESENTED. IN THE ENERGY RANGE GREATER THAN 2-3 MEV THE REFLECTED N SPECTRA (FROM ALL THOSE MATERIALS AND GRAPHITE) ARE MUCH SOFTER THAN THE INCIDENT N SPECTRA, AND AT ENERGIES SMALLER THAN 50 KEV THE SHAPE OF THE SPECTRA APPROACHES THAT OF THE 1-E SPECTRUM. THE MAJOR CONTRIBUTION TO THE REFLECTED N SPECTRA IS MADE BY N WITH ENERGIES GREATER THAN 0.1 MEV. THE INTEGRATED DOSE ALBEDO OF N REFLECTED FROM TI IS SATISFACTORILY DESCRIBED BY THE EMPIRICAL EQUATION OF FRENCH (1964).

UNCLASSIFIED

USSR

UDC: 616.24-003.668.4-08

ORLOVA, A.A., Clinic of the Institute of Labor Hygiene and Occupational Diseases, AMN USSR, Moscow.

"The Current State of Berylloisis Treatment"

Moscow, Klinicheskaya Meditsina, No 3, 1970, pp 140-143

Abstract: After reports of American researchers on berylliosis, the author instituted steroid therapy in a large group of patients in various stages of illness. The therapeutic effect was immediate, illness lessened, disposition was improved, cough abated, pulmonary catarrhal symptoms almost disappeared, appetite was improved, and weight increased. In many cases x-rays showed reversibility of pulmonary granulomatosis. The effect was constant and durable. In third-stage patients, the progress of the disease was retarded, and life prolonged. The unwanted side effects of corticosteroids, when they occurred, were remedied by diminishing the dose. Vitamins, spasmolytic agents and cardiac stimulants were used as adjuncts. Considering the gravity of involvements and complications in beryllosis, it can be enthusiastically stated that hormonal therapy gives the most beneficial therapeutic effect in berylliosis.

1/1

USSR

UDC 669.71:548.53

BOCHVAR, O. S., ORLOVA, A. I., KUNYAVSKAYA, T. M., SOLODOVA, V. F.

"Kinetics of Technical Aluminum Recrystallization Process"

V sb. Struktura i svoystva legk. splavov (Structure and Properties of Light Alloys — collection of works), Moscow, Nauka Press, 1971, pp 58-61 (from RZh-Metallurgiya, No 4, Apr 72, Abstract No 4I626)

Translation: A study was made of the effect of the chemical composition and annealing conditions on the kinetics of the process of recrystallization of technical aluminum sheets type AD00 (99.7% Al) and AD1 (99.4% Al). The sheets 2 mm thick were obtained by the method of roll rolling from ingots with globular macrostructure homogenized at 560° for 24 hours with a 300 × 1,200 mm cross section cast by the continuous casting method. Hot deformation of the ingots was done at 400-360° with a total degree of deformation of 96.5%. Cold deformation was carried out with a degree of deformation of 80% without intermediate annealing. The kinetic curves were constructed for 200-600° every 50°. The controllable properties were σ_B, $\sigma_{0.2}$, and δ. The isochrons σ_B and δ were constructed for holding 10 and 60 minutes. The characteristic microstructures of the annealed specimens of sheet technical aluminum of two compositions are presented. The process of recrystallization of the cold-rolled AD00 and AD1 aluminum

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BOCHVAR, O. S., et al., Struktura i svoystva legk. splavov, Moscow, Nauka Press, 1971, pp 58-61

develops as recrystallization in situ. The difference in the kinetics of the recrystallization process is caused by different type of substructure arising during the process of polygonization at increased temperatures. The consequence of the different dislocation structure of the cold-rolled aluminum is a different mechanism of the polygonization process at increased temperatures. This different dislocation structure is, in turn, caused by a different nature of the phases and degree of heterophase nature of the initial structure of the ingot. Three illustrations and a 7-entry bibliography.

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1/2 014 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--CONDENSATION OF 1,HYDROXPHTHALANS AND PHTHALYLIUM SALTS WITH PHENYLNITROMETHANE AND NITROACETONITRILE -U-

AUTHOR-(02)-NEKRASOVA, G.V., ORLOVA, A.N.

COUNTRY OF INFO--USSR

SOURCE--ZH. ORG. KHIM. 1970, 6(3) 600-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--BENZENE DERIVATIVE, NITROMETHANE, ACETONITRILE, CYANIDE, HYDROGEN BONDING, CONDENSATION REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1407 STEP NO--UR/0366/70/006/003/0600/0606

CIRC ACCESSION NO--AP0112401

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--07OCT70

CIRC ACCESSION NO--AP0112401

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONDENSATION OF PHCH SUB2 NO SUB2 OR NCCH SUB2 NO SUB2 WITH 1,(R SUBSTITUTED), 1,HYDROXY,3,3,DIMETHYL,1,PHENYLPHTHALAN (I) GAVE THE FOLLOWING 1,R,1,(CHR PRIME1 NO SUB2) DISUBSTITUTED 3,3,DIMETHYL,1,PHENYLPHTHALANS (II) (R, R PRIME1 GIVEN): PH, PH; P-MEC SUB6 H SUB4, PH; P-MEOC SUB6 H SUB4, PH; PH, CN; P-MEC SUB6 H SUB4, CN; AND P-MEOC SUB6 H SUB4, CN. THE REACTION OF I SALTS WITH PHCH SUB2 NO SUB2 OR NCCH SUB2 NO SUB2 ALSO GAVE II, INDICATING THAT BOTH THESE REACTIONS HAVE HETEROLYTIC CHARACTER. II CONTG. PH GROUPS HAVE MORE STABLE H BONDING THAN II CONTG. CN GROUPS.

UNCLASSIFIED

USSR

UDC: 8.74

MELIKHOV, A. N., IVANOV, G. I., INOZEMTSOV, Z. P., ORLOVA, A. S.

"A Program for Checking an Automaton for Contradiction, Redundancy and Ripple-Through Jumps"

Inform. materialy. Nauch. sovet po kompleks. probl. "kibernetiki" AN SSSR (Informational Materials. Scientific Council on the Complex Problem of Cybernetics, Academy of Sciences of the USSR), 1971, No 7(54), pp 118-119 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V554)

[No abstract]

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ORLOVA, D.

"Electric Impulses Treat the Heart"

Moscow, Zdorov'ye, No 2, 1971, pp 7-8

Abstract: In 1955 B. M. Tsukerman of the Institute of Surgery im. A. V. Vishnevskiy succeeded in halting auricular fibrillation in a dog by supplying an electrical charge through electrodes placed on the exposed heart. Four years later Tsukerman and A. A. Vishnevskiy, director of the Institute, developed a method based on this principle for treating chronic disturbances of the cardiac rhythm in man. It has proven effective in a variety of arrhythmias without producing side effects and is now routinely used in clinics, hospitals, ambulances, etc. in many Soviet cities. Vishnevskiy, Tsukerman, and others associated with the project were awarded the 1970 State Prize of the USSR for their work.

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UDC 620.193.01:669.29

RISKIN, I. V., ORLOVA, F. A., LADOZHINA, Z. I.

"Effect of Oxygen on the Corrosion Behavior of Titanium Alloyswith 0.2% Palladium in Hydrochloric Acid"

Moscow, Zashchita Metallov, Vol 8, No 6, 1972, pp 704-705

Abstract: During deoxidation of hydrochloric and sulfuric acid solutions, activation of titanium alloys containing cathode additives can occur [F. A. Orlova, et al., Tr. konf. po korrozionnoy stoykosti splavov na osnove titana i niobiya, Moscow, 124, 1967; N. D. Tomashov, et al., Zashchita metallov, No 6, 145, 1970]. In the described experiment, the solutions were scavenged in advance and during the experiment with pure argon, technical argon (0.003 O_2), nitrogen with 2-3% O_2, and air, respectively. Before the experiment the specimens were pickled in concentrated HNO_3, cleaned with emery paper, and washed in alcohol and distilled water. Intense mixing took place with rotation of the sample at 3,000 rpm in the shape of a vane with the tip bent at 90 degrees to the axis of rotation. In the deoxidized solutions with a concentration of 10-20% HCl at 20° the alloy behaves in practice like pure titanium. In an atmosphere of technical argon (0.003% O_2) the corrosion rate in a 5% solution at 80° is 0.1-0.2 g/m^2-hour, and under intense mixing conditions, 0.5 grams/m^2-hour.

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RISKIN, I. V., et al., Zashchita Metallov, Vol 8, No 6, 1972, pp 704-705

In the aerated solution with the same concentration and temperature, mixing does not lead to depassivation of the alloy. In the deaerated solution at 80° and with boiling the alloy potential fluctuates, remaining 0.3-0.5 volts more negative than in the aerated solution. Thus, the dissolved oxygen has a passivating effect on the corrosion behavior of titanium alloy with 0.2% palladium at various hydrochloric acid concentrations to the boiling point.

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